Scientific Research Publishing

Open Journal of Pediatrics, 2026, 16(2), 372-379
https://www.scirp.org/journal/ojped
ISSN Online: 2160-8776
ISSN Print: 2160-8741

Epidemiology and Clinical Presentation of Cleft Lip and Palate in Brazzaville

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How to cite this paper: Mabika, B.D.D., Ngouoni, G.C., Ngoua Essininguele, L.M., Ngakeni, N.Y., Bamboula, C. and Ondzotto, G. (2026) Epidemiology and Clinical Presentation of Cleft Lip and Palate in Brazzaville. *Open Journal of Pediatrics*, **16**, 372-379.
https://doi.org/10.4236/ojped.2026.162036

Received: February 11, 2026
Accepted: March 20, 2026
Published: March 23, 2026

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Abstract

Objective: This paper aims to report on the epidemiological aspects and clinical presentations of cleft lip and palate in Brazzaville. **Materials and Methods:** A descriptive cross-sectional study with retrospective data collection was conducted in the Stomatology and Maxillofacial Surgery Department of the Brazzaville University Hospital over a period of six (6) years, from 1 January 2020 to 31 December 2025. Facial malformations treated in the department with usable medical records were included. **Results:** 175 malformations were admitted, including 164 cleft lip and palate cases, representing 93.7% of facial malformations. The median age at the first consultation was 1 month, with extremes ranging from 1 day to 24 years. Boys accounted for 54.9% of cases, compared with 45.1% for girls. The diagnosis was made postnatally in 98.2% of cases, compared with 1.8% antenatally. Continuous exposure to cooking smoke was found in 69.5% of cases. The clinical aspects were varied, with cleft lip and palate in 50.6% of cases, cleft lip and palate in 41.5% of cases, and cleft palate in 8% of cases. Several clinical consequences were found, including eating disorders (90.9%), malnutrition (61%), phonation disorders (49.4%) and recurrent ear infections (27.4%). **Conclusion:** The majority of patients are predominantly male children born to parents with low socioeconomic status, exposed to cooking smoke during pregnancy, and presenting mainly with cleft lip, followed by cleft lip and palate.

Keywords

Facial Malformations, Cleft Lip and Palate, Cooking Smoke, Associated Anomalies, Malnutrition, Ear Infections

1. Introduction

Cleft lip and palate (CLP) is the most common congenital malformation of the cephalic extremity, manifesting as a break in the continuity of the lip and/or palate [1]-[3]. They constitute a major health problem due to the social disability associated with the disfigurement they cause. They can be unilateral or bilateral, isolated or part of a multiple malformation syndrome [2]. In Africa, delayed consultation and difficulties in accessing care worsen their functional prognosis [4].

In Brazzaville, in a context marked by delayed consultation, socio-economic constraints and partial dependence on solidarity programmes [4]-[6], an updated epidemiological and clinical analysis appears essential to guide the organisation of care and improve treatment.

This paper aims to describe the epidemiological and clinical aspects of cleft lip and palate at the Brazzaville University Hospital.

2. Materials and Methods

This was a descriptive cross-sectional study with retrospective data collection, conducted in the Stomatology and Maxillofacial Surgery Department of the Brazzaville University Hospital over a period of six (6) years, from 1 January 2020 to 31 December 2025.

This department provides free treatment for cleft lip and palate.

Our study population consisted of facial malformations treated in the department during the study period. Only cleft lip and palate facial malformations treated in the department with usable medical records were included. Other facial malformations and clefts with unusable records were excluded. This resulted in a total of 175 facial malformations, 164 of which were cleft lip and palate.

Data were collected from the hospitalization register, patient medical records completed after questioning and physical examination, and prenatal consultation records during pregnancy.

Two levels of analysis were used:

- Analysis of all facial malformations: each patient with a facial malformation was counted. This analysis enabled the proportion of cleft lip and palate within facial malformations to be studied.
- Analysis of patients with cleft lip and palate: for epidemiological and clinical aspects.

The study variables were:

- Age at first consultation, sex, place of birth, time of first public outing;
- Age of parents, socioeconomic status, mother's level of education, consanguinity, exposure to domestic smoke, alcohol consumption, exposure to tobacco;
- Origin, time of diagnosis, admission procedures, type of lesion, laterality;
- Associated clinical manifestations: presence of eating disorders (aspiration), malnutrition, phonation disorders, recurrent ear infections. These were recorded in medical records after clinical confirmation during admissions.

The data were entered and analyzed using SPSS 2.0 software. Qualitative variables were expressed as numbers and percentages. Quantitative variables were expressed as means ± standard deviation. A descriptive approach was favored, without seeking causal correlations.

Anonymity, data confidentiality and ethical considerations were respected.

3. Results

175 malformations were admitted, including 164 cleft lips and palates, representing 93.7% of facial malformations. The number of patients was increasing every year.

The median age at the first consultation was 1 month, with extremes ranging from 1 day to 24 years. 95.1% of the population were paediatric patients. There were 90 boys (54.9%) and 74 girls (45.1%). The children were kept away from the public in 64 cases (39%) for more than three (3) months.

The diagnosis was made postnatally in 161 cases (98.2%) and antenatally in 3 cases (1.8%). The patients came from both urban (58%) and rural areas, with a significant proportion from regions far from Brazzaville. 59.1% of cleft cases were the first or second child in the family.

Admission was direct in 61% of cases and by referral in 39%. The median age of mothers was 28 years [24 years; 30 years] with ages ranging from 13 to 40 years. In contrast, the median age of the fathers was 35 years [30 years; 40 years], with extremes ranging from 15 to 55 years. 61% of parents were from a disadvantaged socioeconomic background. 52% of mothers had a primary school education.

Certain factors were frequently reported during these pregnancies, including lack of folic acid supplementation (30.5%), regular alcohol consumption (36.6%), smoking (6%), continuous exposure to smoke during cooking (69.5%), and attempted chemical abortion before the eighth week of amenorrhoea (5.5%). A family history of cleft palate was found in 6% of cases, as well as consanguinity in 18% of cases (**Figure 1**).

The clinical aspects were varied, with labial-velar involvement in 50.6%, labial-palatal involvement in 41.4% and velo-palatal involvement (**Figure 2**) in 8%. Disfiguring forms were apparent in 93.3% of cases. Left-sided clefts were found in 52.4% of cases, and 9.7% of clefts were bilateral (**Figure 3**).

9.8% of clefts were associated with musculoskeletal, cardiac, ocular (**Figure 4**), nasal, and urogenital abnormalities. 3.7% of clefts were syndromic, including four (4) cases of Von der Woude and two (2) cases of Pierre Robin.

Cleft palates were found predominantly in girls, at a ratio of two girls to one boy. Cleft lip and palate and cleft lip were found more frequently in males, with a male/female ratio of 1.16 and 1.38, respectively.

Several clinical consequences were found, including feeding disorders (90.9%), malnutrition (61%), phonation disorders (49.4%) and recurrent ear infections (27.4%).

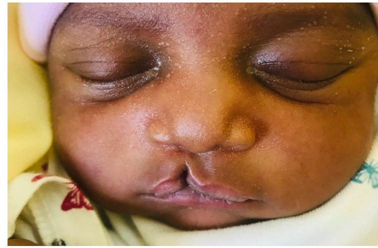

Figure 1. Illustration of unilateral cleft lip.

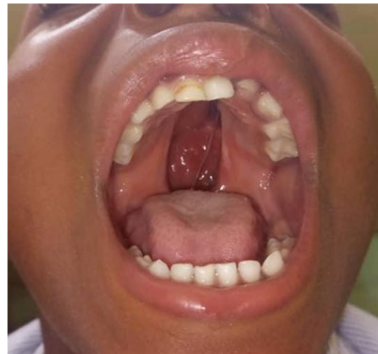

Figure 2. Illustration of a velopalatina cleft.

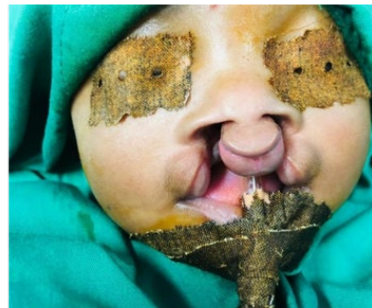

Figure 3. illustration of a bilateral cleft lip.

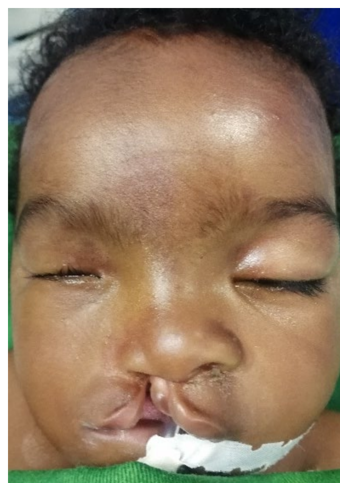

Figure 4. Illustration of a cleft lip associated with right anophthalmia.

4. Discussion

Cleft lip and palate was the most common malformation, with a relative frequency of 93.7%.

This trend is the norm in maxillofacial surgery departments, but with varying frequencies in African literature [6] [7].

The median age at the first consultation was 1 month, compared with 11.8 years in the eastern part of the Republic of the Congo [8]. This can be explained by improved access to cleft lip and palate care following the solidarity offer [9].

A male predominance was found in the majority of studies, as well as a distribution of cleft types according to gender [10]-[13]. This can be explained mainly by biological and embryological factors.

In fact, facial structures develop at specific stages of embryonic life, and in boys, the closure of facial buds occurs slightly later, which increases the period of vulnerability to disturbances (genetic, environmental, nutritional or toxic). In addition, certain sex-related genetic factors and the influence of foetal sex hormones can modulate craniofacial growth differently, making boys more prone to cleft lip and cleft palate, while isolated cleft palate is more common in girls [14] [15].

Children were kept away from the public in 39% of cases for more than three (3) months, reflecting the stigma and sense of shame felt by parents [7] [16].

The diagnosis was made in 98.2% of cases postnatally, compared with 1.8% antenatally [17]. This observation is consistent with that of Oulai S. *et al.* in Côte d'Ivoire, where only six (6) cases were diagnosed before birth, compared with 50 to 80% of antenatal diagnoses in Europe [18] [19]. This difference can be explained by the fact that 3D and 4D ultrasound technology and the advanced expertise of operators are not yet available everywhere in Africa, but are available in Europe [17] [19].

Patients came from both urban and rural areas, with a significant proportion from regions far from Brazzaville, demonstrating parents' commitment to care and improved availability of care for all [9]. 59.8% of clefts were the first or second in the sibling group, a result similar to that reported in the literature [3].

Mothers came on their own in 61% of cases, reflecting a weakness in the referral system. The mothers were relatively young, with a median age of 28 years, had a low level of education, and 61% were from a disadvantaged socioeconomic background, as highlighted in the African literature [10] [20].

Several factors likely to promote the occurrence of clefts were found during pregnancy, including lack of folic acid supplementation, regular alcohol consumption, smoking, continuous exposure to smoke during cooking, attempted chemical abortion before the eighth week of amenorrhoea, a family history of cleft palate, and consanguinity. These factors were found to varying degrees without proof of causality, as in certain studies [21]-[24]. However, some studies have found that certain factors are involved, notably smoking, obesity and high blood pressure [13] [25].

Furthermore, some studies have noted the role of exposure to smoke and air pollution in the occurrence of cleft lip and palate [26] [27].

The clinical aspects varied, with labioalveolar involvement being the most common. Cleft lip and palate and cleft lip were predominant in boys, while cleft palate was predominant in girls. Left-sided clefts were found in 52.4% of unilateral clefts [2] [24]. 9.7% of clefts were bilateral.

The profile of these characteristics was identical to that in the Democratic Republic of the Congo [8], whereas in other studies cleft lip and palate were predominant [10]-[12] [24].

Furthermore, these lesions were associated with other malformations in 9.8% of cases, including musculoskeletal abnormalities of the extremities, cardiac, ocular, nasal and urogenital abnormalities. This proportion varies in the literature, ranging from 5% in the east of the Republic of the Congo [3] to 11% in Sudan [10] and 20% in Port Harcourt, mainly cardiac and auditory [12]. This difference can be explained by the varying importance of genetic factors in different regions, as well as by underdiagnosis in contexts with limited resources [11] [14]. 3.7% of cases were syndromic, including four (4) cases of Von der Woude syndrome and two (2) cases of Pierre Robin syndrome, a lower proportion than that reported in the literature [14].

Several clinical consequences were found, including eating disorders (90.9%), malnutrition (61%), phonation disorders (49.4%) and recurrent ear infections (27.4%), clefts, proportions that are underestimated in our context compared to certain literature [11] [24].

This study provides a local baseline and paves the way for future analytical and multicentre studies. The limitations of our study include its retrospective nature, dependence on the quality of medical records, and the fact that it was conducted in a single centre, which may limit the generalisation of the results to other settings.

5. Conclusion

The epidemiological and clinical profile of cleft lip and palate is characterised by a predominance of male children born to parents with low socioeconomic status, both in urban and rural areas, with cleft lip being the most common condition. These clefts resulted from pregnancies exposed to cooking smoke, with early consultation, highlighting the positive impact of solidarity-based care policies. Analytical studies are needed to better identify risk factors and strengthen prevention and early care strategies.

Authors' Contributions

All authors contributed to this work. All have read and approved the final version of this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Beziat, J.L., Abou Chebel, N., Marcelino, J.P. and Gleizal, A. (2007) Les fentes du palais primaire et du palais secondaire. *Revue d'odonto-stomatologie*, **36**, 217-245.

[2] Eshete, M., Gravenm, P.E., Topstad, T. and Befikadu, S. (2011) The Incidence of Cleft Lip and Palate in Addis Ababa, Ethiopia. *Ethiopian Medical Journal*, **49**, 1-5.

[3] Longombe, A.O. and Tshimbila Kabangu, J.M.V. (2012) Les fentes labiopalatines à l'est de la République Démocratique du Congo. Aspects épidémiologiques. *Annales de Chirurgie Plastique Esthétique*, **57**, 245-249. https://doi.org/10.1016/j.anplas.2012.02.012

[4] Mabika Bredel, D.D., Ngoua, E., Niengo, O.G., Trigo, E., Mpoy, E.M.C. and Ondzotto, G. (2025) Les fentes labiopalatines en chirurgie humanitaire: Expérience d'une approche multidis-ciplinaire à Brazzaville. *Revue du Collège d'Odonto-Stomatologie d'Afrique et de Chirurgie Maxillo-Faciale*, **32**, 37-41.

[5] Mabika, B.D.D., Ngoua, E.L., Ngakegni, N.Y., *et al.* (2025) Activités humanitaires en chirurgie maxillo-faciale à Brazzaville. *Health Research in Africa*, **3**, 40-44.

[6] Butali, A., Adeyemo, W.L., Mossey, P.A., Olasoji, H.O., Onah, I.I., Adebola, A., *et al.* (2014) Prevalence of Orofacial Clefts in Nigeria. *The Cleft Palate Craniofacial Journal*, **51**, 320-325. https://doi.org/10.1597/12-135

[7] Progin, V. (2012) Expérience psycho-affective des parents dont l'enfant nait avec une fente labio-maxillo-palatine. [Mémoire]. Tribourg. 108 p.

[8] Sangwa, C.M., Kayembe, J.M., Kalala, M.J., *et al.* (2014) Fentes labiopalatines en République Démocratique du Congo: Aspects épidémiologiques et thérapeutiques. *Pan African Medical Journal*, **17**, Article No. 319.

[9] Mabika, B.D.D., Essininguele, L.N., Monkessa, C.M.E., Outsouta, G.N., Yvette, N.N., Otiobanda, F., *et al.* (2025) Cleft Lip and Palate: Impact of the Introduction of Free Care at the Brazzaville University Hospital Centre. *Open Journal of Pediatrics*, **15**, 557-564. https://doi.org/10.4236/ojped.2025.154052

[10] Adesina, O.A., Efunkoya, A.A., Olaitan, A. and Adesina, O.O. (2017) Associated Anomalies in Cleft Lip and Palate: Analysis of 811 Consecutive Patients. *South Sudan Medical Journal*, **10**, 60-63.

[11] Conway, J.C., Taub, P.J., Kling, R., Oberoi, K., Doucette, J. and Jabs, E.W. (2015) Ten-year Experience of More than 35,000 Orofacial Clefts in Africa. *BMC Pediatrics*, **15**, Article No. 8. https://doi.org/10.1186/s12887-015-0328-5

[12] (2025) Epidémiologie, résultats et difficultés des chirurgies de la fente palatine à port Harcourt: Etude rétrospective sur 10 ans. *Port Harcourt Medical Journal*, **19**, 51-60.

[13] Ács, M., Cavalcante, B.G.N., Bănărescu, M., Wenning, A.S., Hegyi, P., Szabó, B., *et al.* (2024) Maternal Factors Increase Risk of Orofacial Cleft: A Meta-Analysis. *Scientific Reports*, **14**, Article No. 28104. https://doi.org/10.1038/s41598-024-79346-7

[14] Bugaighis, I. (2015) A Critical Review of the Prevalence of Cleft Lip and Cleft Palate in Arab Countries. *BMC Pediatrics*, **15**, Article No. 8.

[15] Kochhar, H.P.S., Peippo, J. and King, W.A. (2001) Sex Related Embryo Development. *Theriogenology*, **55**, 3-14. https://doi.org/10.1016/s0093-691x(00)00441-6

[16] Grollemund, B., Galliani, E., Soupre, V., Vazquez, M.-., Guedeney, A. and Danion, A. (2010) L'impact des fentes labiopalatines sur les relations parents-enfant. *Archives de Pédiatrie*, **17**, 1380-1385. https://doi.org/10.1016/j.arcped.2010.06.026

[17] Oulai, S., Cissé, L., Enoh, J., Yao, A., Maho, S. and Andoh, J. (2008) Vécu psychologique des mères de nouveau-nés malformés dans le centre hospitalier et univer-

sitaire de Treichville (Côte-d'Ivoire). *Archives de Pédiatrie*, **15**, 357-361. https://doi.org/10.1016/j.arcped.2007.12.012

[18] Jakonsone, G., *et al.* (2010) Prenatal Sonographice Diagnosis of Clef and Palate. *Journal of Prenatal Medicine*.

[19] (2011) Two-D versus 3D Ultrasound in Prenatal Diagnosis of Cleft Lip: A Meta-Analysis. *Ultrasound in Obstetrics & Gynecology*, **38**, 667-673.

[20] Pérez Martínez, C., Béal, E. and Grollemund, B. (2016) Le retrait relationnel chez les enfants porteurs d'une fente labio-palatine et l'impact sur les parents. Une revue de la littérature et un protocole de recherche clinique. *Devenir*, **27**, 269-280. https://doi.org/10.3917/dev.154.0269

[21] Dixon, M.J., Marazita, M.L., Beaty, T.H. and Murray, J.C. (2011) Cleft Lip and Palate: Understanding Genetic and Environmental Influences. *Nature Reviews Genetics*, **12**, 167-178. https://doi.org/10.1038/nrg2933

[22] Alghamdi, S.M., Aljohar, A.J., Alamoudi, R.A., Alrejaye, N.S., Abdulhameed, F.D., *et al.* (2024) Assessment of Non-Syndromic Orofacial Cleft Severity and Associated Environmental Factors in Saudi Arabia: A Cross-Sectional Study. *The Saudi Dental Journal*, **36**, 480-485. https://doi.org/10.1016/j.sdentj.2023.12.009

[23] Alkharafi, L., Mokhtar, A., Burezq, H., Almerjan, D., Dashti, G., Almutalaqem, R., *et al.* (2023) Seasonal, Geographic, and Ethnic Influence on the Prevalence of Orofacial Clefts in Kuwait: A Nationwide Study. *The Cleft Palate Craniofacial Journal*, **61**, 1257-1265. https://doi.org/10.1177/10556656231163023

[24] Mossey, P.A. and Catilla, E.E. (2003) Global Registry and Database on Craniofacial Anomalies. Report of a WHO Registry Meeting on Craniofacial Anomalies. World Health Organization. https://iris.who.int/bitstream/handle/10665/42840/9241591102.pdf

[25] Fell, M., Dack, K., Chummun, S., Sandy, J., Wren, Y. and Lewis, S. (2021) Maternal Cigarette Smoking and Cleft Lip and Palate: A Systematic Review and Meta-Analysis. *The Cleft Palate Craniofacial Journal*, **59**, 1185-1200. https://doi.org/10.1177/10556656211040015

[26] Rao, A., Ahmed, M.K., Taub, P.J. and Mamoun, J.S. (2016) The Correlation between Maternal Exposure to Air Pollution and the Risk of Orofacial Clefts in Infants: A Systematic Review and Meta-Analysis. *Journal of Oral and Maxillofacial Research*, **7**, e2. https://doi.org/10.5037/jomr.2016.7102

[27] Jiang, W., Xie, W., Ni, B., Zhou, H., Liu, Z. and Li, X. (2021) First Trimester Exposure to Ambient Gaseous Air Pollutants and Risk of Orofacial Clefts: A Case-Control Study in Changsha, China. *BMC Oral Health*, **21**, Article No. 530. https://doi.org/10.1186/s12903-021-01876-7